

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
GEOFFREY L. MELNICK  
G. E. EHRLICH (1995) LTD.  
11 MENACHEM BEGIN STREET  
RAMAT GAN, ISRAEL 52 521

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year) <b>07 JUL 2008</b>	
Applicant's or agent's file reference <b>27838</b>	
FOR FURTHER ACTION See paragraph 2 below	
International application No. <b>PCT/IL04/00706</b>	International filing date (day/month/year) <b>01 August 2004 (01.08.2004)</b>
Priority date (day/month/year) <b>31 July 2003 (31.07.2003)</b>	
International Patent Classification (IPC) or both national classification and IPC <b>IPC: B41J 2/155( 2006.01)</b> <b>USPC: 347/42,43</b>	
Applicant <b>EINAT, NISSIM</b>	

## 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

## 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Date of completion of this opinion <b>17 June 2008 (17.06.2008)</b>	Authorized officer <b>Matthew Luu</b>  Telephone No. (571) 272-1750
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Form PCT/ISA/237 (cover sheet) (April 2007)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/IL04/00706

## Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing☐ table(s) related to the sequence listing

b. format of material

☐ on paper☐ in electronic form

c. time of filing/furnishing

☐ contained in the international application as filed.☐ filed together with the international application in electronic form.☐ furnished subsequently to this Authority for the purposes of search.4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Form PCT/ISA/237(Box No. I) (April 2007)

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/IL04/00706

**Box No. IV Lack of unity of invention**

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:
- ☐ paid additional fees
  - ☐ paid additional fees under protest and, where applicable, the protest fee
  - ☐ paid additional fees under protest but the applicable protest fee was not paid
  - ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
  - ☒ not complied with for the following reasons:  
See the lack of unity section of the International Search Report (Form PCT/ISA/210)

4. Consequently, this opinion has been established in respect of the following parts of the international application:

- ☒ all parts.
- ☐ the parts relating to claims Nos. \_\_\_\_\_

Form PCT/ISA/237 (Box No. IV) (April 2007)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITYInternational application No.  
PCT/IL04/00706**Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)

Claims 1-79 YES  
Claims NONE NO

Inventive step (IS)

Claims NONE YES  
Claims 1-79 NO

Industrial applicability (IA)

Claims 1-79 YES  
Claims NONE NO**2. Citations and explanations:**

Please See Continuation Sheet

Form PCT/ISA/237 (Box No. V) (April 2007)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/IL04/00706

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

Claims 1-79 lack an inventive step under PCT Article 33(3) as being obvious over Hsu et al. (6,652,068) in view of Baker et al. (5,025,271), Hermanson (5,581,284), Kurata et al. (2001/0040610), and Cowger et al. (5,013,354).

In re claim 38, *Hsu et al. (068)* teaches an ink jet print head (210, Fig. 16) [Column 5 lines 32-36] comprising a print head matrix (210, 220, Fig. 16) [Column 5 lines 34-36], the matrix (210, 220) having a plurality of nozzles (112, Fig. 16) [See Fig. 16] for bubble formation and expulsion opening onto a print side surface (side of printhead where nozzle layer (102, Fig. 16) is mounted) of said matrix [Column 3 lines 36-39] and a plurality of local reservoirs (132, 134, 136, 196, and 216, Fig. 16), wherein each of said local reservoirs (132, 134, 136, 196, and 216) is configured to supply ink to at least respective nearby nozzle of said nozzles [Column 5 lines 47-53, See also Fig. 16], said local reservoirs (132, 134, 136, 196, and 216) opening onto an ink supply surface (bottom half of print cartridge (220, Fig. 16)) of said matrix [See Fig. 16] and wherein each one of said plurality of nozzles (112) is arranged with its own respective local ink detaining storage reservoir (132, 134, 136, 196, and 216) [Column 5 lines 47-53, See Fig. 16]. However, *Hsu et al. (068)* does not teach ink supplied is by capillary action.

*Baker et al. (271)* teaches ink supplied to at least respective nearby nozzle of said nozzles by capillary action [Abstract lines 1-11, Column 3 lines 5-12, See also Fig. 2].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide ink supplied to at least respective nearby nozzle of said nozzles by capillary action as taught by *Baker et al. (271)* in the inkjet printhead of *Hsu et al. (068)* for the purposes of feeding ink to the printhead [Abstract lines 7-11].

In re claim 42, *Hsu et al. (068)* in combination with *Baker et al. (271)* teaches the ink jet print head of claim 38 [see rejection above]. However, *Baker et al. (271)* does not teach wherein said print side surface and said ink supply surface are respectively opposite sides of said matrix.

*Hsu et al. (068)* further teaches wherein said print side surface (the side of the printhead where the nozzle layer (102) is mounted) and said ink supply surface (bottom of the print cartridge (220)) are respectively opposite sides of said matrix (210, 220) [See Fig. 16].

In re claim 59, *Hsu et al. (068)* teaches an ink jet printing head (210, Fig. 16) comprising a plurality of nozzles (112, Fig. 15 and 16) for forming and expelling ink droplets for printing onto a print medium [Column 3 lines 36-39], wherein the plurality of nozzles (112) is arranged into a two dimensional grid substantially to be coextensive with a standard size print medium [See Fig. 15], the inkjet printing head (210) further comprises a plurality of local ink-detaining reservoirs (132, 134, 136, 196, 216, Fig. 16), and each of said local reservoirs is configured to supply ink to at least one respective nearby nozzle [Column 3 lines 36-38, Column 5 lines 47-53].

Form PCT/ISA/237 (Supplemental Box) (April 2007)

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/IL04/00706

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

However, Hsu et al. (068') does not teach the ink is supplied by capillary action.

*Baker et al. (271')* teaches ink is supplied to the nozzles by capillary action [[Abstract lines 1-11, Column 3 lines 5-12, See also Fig. 2].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide ink supplied to at least respective nearby nozzle of said nozzles by capillary action as taught by Baker et al. (271') in the inkjet printhead of Hsu et al. (068') for the purposes of feeding ink to the printhead [Abstract lines 7-11].

In re claim 40, *Hsu et al. (068')* in combination with *Baker et al. (271')* teaches the ink jet print head of claim 38 [see rejection above], wherein said matrix is arranged into a substantially rectangular printing area dimensioned to give simultaneous printing coverage of standard sized printing media upon being placed substantially over said standard sized printing media [Hsu et al. (068') See Fig. 15, Column 7 lines 4-6].

In re claim 41, *Hsu et al. (068')* in combination with *Baker et al. (271')* teaches the ink jet print head of claim 40 [see rejection above], arranged for printing on said standard sized printing media during a period of unchanged relative displacement between said print head and said printing media [Hsu et al. (068') See Fig. 15, Column 7 lines 4-6].

However, Hsu et al. (068') and Baker et al. (271') both do not explicitly teach the inkjet printhead to be a pagewidth or serial printer.

*Hermanson (284')* teaches an inkjet printhead which can be used as a pagewidth or serial printer [Column 6 lines 44-50].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the inkjet printhead of Hsu et al. (068') in an inkjet printer or apparatus and for such an inkjet printhead to be capable of use as a pagewidth or serial printhead as taught by Hermanson (284') in the inkjet head of Hsu et al. (068') in combination with Baker et al. (271') for the purposes of extending the life of the printhead [Hermanson (284') Column 1 lines 6-8]. Therefore, the inkjet printhead matrix is capable of being arranged into a substantially rectangular printing area dimensioned to give simultaneous printing coverage of standard sized printing media and arranged for printing on said standard sized printing media during a period of unchanged relative displacement between said print head and said printing media. (Claims 40-41).

In re claim 43, *Hsu et al. (068')* in combination with *Baker et al. (271')* teaches the ink jet print head of claim 38 [see rejection above]. However, Hsu et al. (068') and Baker et al. (271') both do not teach the ink jet head further comprising further comprising an ink distribution device associated with said ink supply surface for distributing ink to reach said local ink reservoirs.

*Kurata et al. (2001/0040610)* teaches ink jet head further comprising an ink distribution device associated with said ink supply surface for distributing ink to reach said local ink reservoirs [Paragraph 50 lines 12-20, Paragraph 52, Paragraphs 57-58].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an ink distribution device associated with said ink supply surface for distributing ink to reach said local ink reservoirs as taught by Kurata et al. (2001/0040610) in the ink jet head of Hsu et al. (068') in combination with Baker et al. (271') for the purposes of replenishing ink into the ink reservoirs [Kurata et al. (2001/0040610) Paragraph 57 lines 3-6].

In re claim 47, *Hsu et al. (068')* in combination with *Baker et al. (271')* and *Kurata et al. (2001/0040610)* teaches the ink jet print head of claim 43 [see rejection above]. However, Hsu et al. (068'), Baker et al. (271'), and Kurata et al. (2001/0040610) both do not teach the ink distribution device is a tubeless distribution device.

*Cowger et al. (354')* teaches an ink distribution device is a tubeless distribution device [Column 2 line 55-Column line 6]. It would have been obvious to one of ordinary skill of the art at the time the invention was made to provide a tubeless ink distribution device as taught by Cowger et al. (354') in the ink jet head of Hsu et al. (068') in combination with Baker et al. (271') and Kurata et al. (2001/0040610) for the purpose of maintaining pressure within an ink reservoir at less than ambient pressure [Cowger et al. (354') Column 2 line 68-Column 3 lines 3].

In re claims 1-37, 39, 44-46, 48-58, and 60-79, please note the lack of unity sent out on June 2, 2008. Also note the rejection as set forth above with respect to claims 38, 40-43, 47, and 59.